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Indian Standard

PACKAGING CODE

PART 2 PACKAGING MATERIALS

Section 2 Paper and Paper Board

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
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Indian Standard

PACKAGING CODE

PART 2 PACKAGING MATERIALS

Section 2 Paper and Paper Board

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Indian Standard

PACKAGING CODE

PART 2 PACKAGING MATERIALS

Section 2 Paper and Paper Board

0. FOREWORD

0.1 This Indian Standard (Part 2/Sec 2) was adopted by the Indian Standards Institution on 30 December 1983, after the draft finalized by the Packaging Code Sectional Committee had been approved by the Marine, Cargo Movement and Packaging Division Council.

0.2 The packaging code is being issued in the following parts, each having one or more sections:

Part 1	Product packaging
Part 2	Packaging materials
Part 3	Ancilliary materials
Part 4	Packages
Part 5	Packaging operations
Part 6	Storage and transportation
Part 7	Packaging machinery
Part 8	Testing

This Code, Part 2, Section 2 deals with paper and paper board as packaging material.

0.3 Packaging materials as are used in the industry are many and varied. These include paper and paper products, textiles, metals and metal foils, plastics and a variety of laminates, wood, glass and ceramics, cushioning materials, strapping and hooping materials, nails, etc. Among these, paper and paper products have the largest applications.

0.3.1 In this Section of the Code, guidelines for the selection of paper and paper board as packaging materials are described. Packages are described in Part 4, Section 2 of the Code. A complete list of Indian Standards related to paper and paper board is given in Appendix A.

0.4 In the preparation of this standard considerable assistance has been derived from BS 1133 : Section 7 : 1967 ' Packaging Code : Paper and board wrappers, bags and containers ', issued by the British Standards Institution (BSI).

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1. SCOPE

1.1 This standard (Part 2/Sec 2) lays down guidelines on the selection of various types of paper and paper board as packaging materials.

2. TERMINOLOGY

2.1 For the purpose of this code the definitions given in IS : 4261-1967* and IS : 4661-1968† in addition to the following shall apply.

2.1.1 *Paper* — 'A sheet material essentially made up of felted and interlacing cellular fibres of natural origin.' It includes all types of papers ranging from the thinnest tissue paper to the heaviest board for packaging. The term paper is sometimes but erroneously used to include sheet material consisting of any types of fibres (animal, mammal or synthetic) felted and interlaced, whether alone or mixed in any proportions.

2.1.2 *Paper Board* — Paper of substance not below 180 g/m^2 (generally 250 g/m^2) characterized by its rigidity is termed as paper board.

3. WRAPPING PAPERS

3.1 Wrapping materials are used both to give a direct immediate protection to the item against abrasion, dust and dirt and for holding several articles together (primary wrapping) and for wrapping of containers (container wrapping). In addition, certain wrapping materials are used as barriers against water (for water vapour proof packaging). Water proof wrapping materials must be impervious to liquid water but not necessarily to water vapour. Water-vapour proof wrapping materials, in addition to being impervious to liquid water must not have a water vapour transmission rate of more than 130 g of water vapour per square metre in 24 hours when measured at 38°C at a relative humidity of 90±2 percent.

3.2 Classification — Wrapping materials are generally classified as given in **3.2.1** to **3.2.11**.

*Glossary of terms relating to paper and pulp based packaging materials.
†Glossary of terms used in paper trade and industry.

3.2.1 *Simple Wrapping Paper* — These are general purpose primary wraps and are widely used as packaging materials because of their strength properties, easy availability, versatility of forms and application, and their relatively low cost. They are, however, not suitable for protecting articles against moisture. These simple wrapping papers should be free from pin holes, tears, lumps and knots and should not crack during normal shaping and folding operations. Only neutral and uncontaminated primary wraps shall be used in direct contact with highly finished articles with corrodible metal surfaces. Simple wrapping papers include the following which are either fed from roll stock or supplied in sheet form.

3.2.1.1 *Kraft paper* — A strong paper manufactured wholly from bleached or unbleached sulphate cellulose fibres (*see* IS : 1397-1967*) used for wrapping articles which do not require a moisture proof barrier, for the initial wrapping layer, for example, for textiles.

3.2.1.2 *Brown paper* — Unglazed kraft paper used for wrapping crockery, glassware, enamel ware and similar articles.

3.2.2 *Crepe Papers* — Ordinarily paper has the capacity to stretch (elongation under tension) by not more than five percent. However, by creping the paper, stretch can be increased up to 35 percent thereby increasing the resistance to puncture and tear. Projections and corners on irregular objects simply stretch the crepe paper at point of contact, thus preventing the puncturing and rupturing that would occur with the use of plain paper. Crepe papers are also used for non-water proof lining of outer container and as a primary wrap for textiles packaged in bales.

3.2.3 *Waterproof Paper Other than Waxed Papers* — The term ' waters proof paper ' covers any type of paper, laminated, coated or impregnated, which is capable of resisting penetration of water in liquid form. A common method of producing waterproof paper is by laminating two or three plies of kraft paper together with bitumen as the laminating agent. Microcrystalline wax is frequently substituted for asphalt, particularly where any bleeding of the asphalt on to the wrapped or packaged article would be injurious, as with furniture wraps, or where any odour from the asphalt would be objectionable, as in food wraps. Increasing use is also being made of thermoplastic waterproof resin laminates, particularly where high resistance to bleeding or delamination is required. These are also used for water-proof lining of packing cases and other wooden-containers and in the bailing of textiles for giving a water-proof layer. For more details *see* IS : 1398-1982†.

*Specification for kraft paper (*first revision*).
†Packing paper, waterproof, bitumen-laminated (*second revision*).

3.2.4 *Reinforced Papers* — The term ' reinforced paper ' is commonly used to designate any structure utilizing paper-base stock combined with fibre strands. Generally reinforced papers are also water-proof since their use usually requires a combination of strength and water-proof quality. Typical use of such papers are wraps for bales, covers for machinery and equipment (both for shipment and for outdoor storage), and liners for boxes and other containers. They are particularly used in those applications where the wrapping is required to impart greater strength. There are many variations in the structure of reinforced papers, although there are only two basic types (a) two plies of kraft paper laminated with asphalt in which fibre-strands or loose-woven fabrics are embeded, and (b) a single ply of kraft asphalt laminated to one ply of fabric, usually burlap.

3.2.5 *Waxed Paper* — Waxed papers are without doubt the most widely used among all types of treated packaging papers. Waxed papers include any base paper stocks to which petroleum wax has been added, either as an impregnation or as a surface coating. Depending on the type of base stock and wax utilised, waxed paper can be made highly water resistant. Paper coated with wax is resistant to atmospheric hydrogen sulphide and served as an effective wrapping for gold and silver embroideries to prevent their tarnishing during storage. For more details, *see* IS : 3962-1967* and IS : 3263-1981†.

3.2.6 *Grease-Resisting Paper* — Grease-resisting paper is employed to protect the soft film of protective coating, such as that of grease against dirt and dust, and also to retain the same during handling and transit. In particular, it is used for the wrapping of metallic articles treated with grease and other corrosion-preventive compounds where a grease-proof wrapper is essential. It should always be remembered that the resistant or treated face of the paper, when wrapped, must be the one next to the preservative coating on the article.

3.2.7 *Glassine* — Glassine is a type of grease-proof paper and is manufactured by redampening and super-calendering of grease-proof paper under high pressure and heat. Super-calendering provides a smoother and glossier surface and greatly increases transparency. Glassine has a good resistance to oils. Glassines are widely used as wraps for cartons, bread, meat and dairy products and in bags for food, textiles, drugs, surgical and pharmaceutical products. They can be made alkali proof, as are required for packaging soaps, and netural (*p*H range 6·5-7·5) as are required for packing highly polished machine parts.

*Waxed paper for general packaging.
†Waxed paper for confectionery (*first revision*).

3.2.8 *Vegetable Parchment* — The outstanding characteristics of vegetable parchment paper for packaging purposes are its combination of high grease-resistance and wet strength. Standard grades resist penetration of almost any type of oils, greases, turpentines and shortening and retain, when wet at least 50 to 60 percent of their original strength. Vegetable parchment is odourless and tasteless and so far as is known may be safely used in direct contact with any edible product (*see* IS : 7161-1973*).

3.2.9 *Tissue Paper* — Tissue papers are used as wrapping and packaging paper in a number of ways. Acid free tissue paper is used primarily for cleaning and wrapping of optical equipment. It is also used for the wrapping of other delicate instruments such as thermometers, valves, magnetic compasses and celluloid items. As initial wrappers of merchandise and for giving cushioning effect, they may be of lighter grammage (16 to 20 g/m^2) while for some other uses the grammage is in the range of (20 to 25 g/m^2). These papers may be white or coloured and are made from bleached chemical pulps. For wrapping silverware and ornaments or similar other metallic items, the paper shall be tested for its staining and tarnishing property with regard to the particular metal. For details of tissue papers used for wrapping and packaging (*see* IS : 8460-1977†).

3.2.10 *Corrugated Papers* — Single-faced corrugated paper is usually employed as a wrapping and cushioning material, generally for inner lining of parcels, boxes and wooden packing cases. It is specially suitable for enveloping curved and irregularly shaped surfaces. Articles wrapped in this manner should be placed inside a box or packing case. Single-faced corrugated paper consists of a sheet of corrugated material adhered to a single ply of backing material. While kraft-to-kraft or kraft-to-jute are the most widely used materials, there are a variety of other materials that are being combined for special purposes, such as glassine or other grease-proof materials used as the corrugating medium with a kraft backing combines grease and oil resistance along with strength and cushioning properties. Light-weight corrugated paper is normally suitable for use as a wrapper for glass, china-ware and other light-weight articles. Heavy articles should be wrapped in more robust corrugated paper. This type can also be more generally employed as a separator between two stores or between the sides of a case and stores and also to fill voids in packing box container. Because of its hygroscopic nature, it shall not be employed in direct contact with metallic parts of corrodible nature. In the case of metallic item of corrodible nature, the preserved item should first be wrapped with either waxed, grease proof or mouldable waxed wrapping.

*Vegetable parchment of greaseproof paper/aluminium foil laminates for wrapping butter.

†Wrapping tissue paper.

3.2.11 *Corrugated Board* — Board consisting of one or more sheets of fluted paper stuck to a flat sheet of paper or board or between several sheets usually of kraft. This has the following classification:

a) *Double-face corrugated fibreboard* — Board made up of a sheet of fluted paper stuck between two sheets of paper or board.

b) *Double-wall corrugated fibreboard* — Board composed of two fluted sheets separated by a flat centre sheet and faced on each outer surface. It is also known as ' double-double face board '.

c) *Triple-wall corrugated fibreboard* — Board composed of four flat sheets and three fluted members combined in the following sequence — a flat sheet, a fluted member, a flat sheet, a centre fluted member, a flat sheet, a fluted member and a flat sheet.

4. TESTING

4.1 Tests for paper and paperboard can be classified into chemical, boichemical and physical. Chemical tests are often associated with the suitability of paper and board for printing. Biochemical tests help to determine the resistance to mould and bacterial attack. Physical tests are largely made to assess the mechanical strength properties of the board.

4.1.1 The other aspect of paper testing and perhaps the most common, is the everyday testing carried out by paper buyers and users in order to determine features such as strength, durability, substance, bulk, weight, quality, bursting strength, breaking strain, absorbency, tensile strength, surface finish, coating, finish, etc. In addition it is often necessary to test paper for light fastness, resistance to grease or water, etc.

4.1.2 Proper methods of paper testing exist, but the sense of touch, and the power of observation play an important part in the first examination of paper. By handling a paper sample, both bulk and weight may be determined, and at the same time, the top and underside of a sheet may be ascertained, unless the paper has been made on a twin wire machine with similar surface on both sides. For details of methods of test, refer to Part 8 of this Packaging code (*under preparation*) and IS : 4006 (Part 1)-1966*, IS : 4006 (Part 2) - 1972†, and IS : 4006 (Part 3)-1978‡, and IS : 1060 (Part 1)-1966§, IS : 1060 (Part 2)-1960‖, and IS : 1060 (Part 3)-1969¶.

*Methods of test for paper and pulp based packaging materials, Part 1.
†Methods of test for paper and pulp based packaging material, Part 2.
‡Methods of test for paper and pulp based packaging materials, Part 3.
§Methods of sampling and test for paper and allied products, Part 1.
‖Methods of sampling and test for paper and allied products, Part 2.
¶Methods of sampling and test for paper and allied products, Part 3.

APPENDIX A

(*Clause* 0.3.1)

INDIAN STANDARDS RELATING TO PAPER AND PAPER BOARD PACKAGING

Indian Standards on paper and pulp based packaging materials:

IS:

1397-1967 Kraft paper (*first revision*)

1398-1982 Packing paper, waterproof, bitumen-laminated (*second revision*)

1776-1961 Folding box board, uncoated

2617-1967 Millboard, grey board and strawboard (*first revision*)

3263-1981 Waxed paper for confectionery (*first revision*)

3962-1967 Waxed paper for general packaging

4006 (Part 1)-1966 Methods of test for paper and pulp based packaging materials, Part 1

4006 (Part 2)-1972 Methods of test for paper and pulp based packaging materials, Part 2

4006 (Part 3)-1978 Methods of test for paper and pulp based packaging materials, Part 3

4261-1967 Glossary of terms relating to paper and pulp based packaging materials

4356-1967 Paper cuttings

5012-1968 Cellulose film

5134-1977 Bitumen impregnated paper (*first revision*)

6615-1972 General purpose packing/wrapping paper

6622-1972 Greaseproof paper

8460-1977 Wrapping tissue paper

8970-1978 Paper-aluminium foil laminates for packaging of food and pharmaceuticals

8971-1978 Paper-aluminium foil laminates for general packaging

9588-1980 Kraft liner

9988-1981 Waxed paper for bread and biscuits